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ABSTRACT

In using conventional print, CD-ROM and online resources, librarians are still middlepersons between publishers and users. By exploiting Internet and World Wide Web online technology and developing local databases, libraries can tap new information sources and make them available to local audiences and others dispersed around the world in an online knowledge exchange. The Library at Kapiolani College of the University of Hawaii has produced several Web-based, client/server, full-text and image databases containing unique bodies of information that are pertinent to the mission of the Library and the College, and valuable to students, faculty and other users worldwide. This paper presents some of Kapiolani College's local online databases as potential models for the type of resource that libraries of the future can develop. These databases have greater flexibility of content than print resources and much wider accessibility; overall, they are proving to be more economical. Local online databases like these will help libraries retain their crucial role in collecting and distributing current research in this era of electronic connectivity when the future of libraries is in question. (AEF)

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The Internet and Local Online Databases: A *Novum Organum* for Twenty-First-Century Library Science

By:

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The Internet and local online databases: a *novum organum* for twenty-first-century library science

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Abstract: *The Internet and World Wide Web will become the forum for introducing and retrieving the most current research in all fields. This technology will also be the means for making public vast accumulations of information and knowledge that, although valuable, will never find their way into conventional print publication. For librarians, who in the past two decades have grown from technological recalcitrants to information innovators, Internet/WWW technology has revolutionary implications. It stands to make librarians the direct intermediaries between library users and the producers of new knowledge, and amounts to a new method for library service — a novum organum for library science.*

Keywords: online databases, libraries, Internet, World Wide Web

1. Introduction

When I began my library career over twenty years ago, in the early stages of library automation, librarians were being bullied by vendors and programmers who did not fully understand the mission and processes of libraries. Rampant computerisation pulled us in its tow toward technologies we did not comprehend. It is no wonder we were technophobic. Furthermore, we were hobbled by our own rigid procedures and customs; we saw automation only as a way to perform faster and, we thought, more economically the same bibliographic tasks we had always performed. Only gradually did the bright idea begin to dawn on us that information technologies were creating possibilities of doing things we had never before considered.

Over the following two decades, the library community overcame its technological intimidation. Today, librarians are up-to-speed with information technologies and have become champions of acquiring access to those technologies for their users. We have followed a learning curve composed of a succession of technological dreams and implementations that have included massive bibliographic databases of shared cataloguing, automated circulation systems, online catalogues, CD-ROM servers and document delivery utilities.

The realisation that these shining breakthroughs were not the end goals, but only evolutionary phases, temporary resting places and even misplaced hopes should have provoked in librarians revolutionary ideas and concepts. They should have made us re-evaluate the foundations of our profession. But through all the technologies, for all the talk of new models for librarians, despite all the quibbling over what now to call ourselves — librarians, information specialists, or even cybrarians — have we really changed?

2. Format management

The most recent technological dream to fade is the so-called virtual library. We have learned from several noble attempts that the fully electronic library cannot be created overnight. The reasons are now quite clear (Ref 1):

(a) it will take a generation for people to get used to exclusively virtual resources;

(b) it will take that long to accumulate a body of electronic literature sufficient to sustain in-depth multi-disciplinary research;

(c) the disparate systems that must talk to each other to link digital resources into fully virtual libraries are not yet interoperable, not ready for 'metadata';

(d) publishers will not accept any threat — real or perceived — to their copyrights.

For at least the next decade or two, then, libraries will continue to select from an assortment of information formats the most appropriate one to meet a specific information need. This strategy, which I call 'format management', is becoming an important part of librarianship. Primarily it involves selection of paper, CD-ROM or online as the appropriate format for an information resource based on the nature of the information itself and on the type of usage it will receive. For example, paper is still desirable for certain types of resources because it

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requires low maintenance, is relatively inexpensive and does not entail sophisticated machines or complicated searching strategies. Paper resources are best suited for background and abstract readings, aesthetic works and texts not meant for data extraction.

CD-ROM, though it behaves like an online resource for extracting data, is actually offline. It is not continuously updated, as online is, and so is best suited for less dynamic information, for information of some importance to users, but not enough to justify a subscription to an expensive online database to get it, and for searching database backfiles offline before incurring online expenses to retrieve the most current information.

Online, of course, is the best technology for extracting data from the highly dynamic information resources that are essential to modern research. But for the most part, even the online databases are less current than they appear to be because they obtain much of their content from print publications: that is, they are by-products of the conventional processes of scholarly and scientific publishing which greatly delays the appearance of research. By the time a new piece of research appears in print, or in its alternate electronic format as an entry in a commercial database, it has already made the rounds of the experts and been criticised, revised and perhaps even replicated. It has also already been worked over by editors, referees and typesetters. Even in very dynamic databases we see research that was conducted much earlier. This is because commercial databases are built on the infrastructure of publishers, editors and marketing departments. These online resources are based on research that was already, or is about to be, published in print sources.

The new online methods, which combine publishing and communications technologies, offer researchers the means to share their findings much earlier, to a much larger circle of peers, even to the entire scholarly community at a point much closer to the moment of discovery. This method of sharing research does not necessarily preclude the referee process, which can be imposed through mediated online resources, but it does dispose of the delays and the costs of printing and physical distribution of the documents. In addition, the research will be seen by many more people than would be possible in a print medium, and because of the cost savings this medium can accommodate esoteric research that would never make it into print.

3. Too willing intermediaries

Libraries dispense knowledge and information they have amassed in their collections or, now, that they have otherwise gained access to through subscription or access fees. But by operating exclusively this way, as we do, librarians become extensions of the publishing industry. We get most of our information and knowledge resources not from the creators of the knowledge but from publishers, whether it be in print or electronic formats. Then we repackage and relabel it for our own customers.

This happens because for a very long time publishers were the most obvious source for knowledge and information. They were not the sole source for these commodities, nor the most economical perhaps. But because publishers had the distribution infrastructures, they were the most convenient source. They also could attract and hold the most notable writers, the researchers and the referees. Publishers, not the researchers or writers, and much less the librarians, controlled the release of new knowledge and information. Librarians simply made it available to wider audiences.

And we became very good at it, too, and very complacent. Perhaps the major intimidation of library automation has not been adjusting to the technology but to the false notion that electronic, non-print information resources were somehow upsetting the library's long-standing association with publishers. But that is not the case. We are still doing the same things we have done in the past — extending the reach of the publishing industry. Though the relationship between libraries and publishers has at times been strained, it became the convention and was therefore very comfortable.

4. Beyond format management

By using conventional print, CD-ROM and online resources, librarians are still middlepersons between publishers and our users. We still are too close to the publishers. But the possibility exists to be more direct intermediaries between our users and the real producers of knowledge. Using the new online technology, librarians can step closer to the sources of the knowledge and information they impart.

While continuing to manage various information formats, including paper, CD-ROM and online, libraries that are intent on promoting to the fullest extent possible a culture of research and learning among their users can exploit Internet/WWW technologies by creating their own local online databases that are specifically pertinent to their missions. Working directly with researchers, subject specialists and local information repositories, and by utilising Internet/WWW applications, librarians can create and manage specialised full-text resources composed of important current research and other information that otherwise would remain undiscovered by many persons in their user communities who need it. Once created on the World Wide Web and discovered by the growing number of Web-browsing researchers, these resources will attract online submissions written by other experts, faculty and specialists who wish to contribute to the growing knowledge base. These same contributors will be willing to regularly update their findings and engage in online forums and listservs, which will promote further research and the growth of knowledge.

Working with data communications specialists, libraries can make these databases accessible to widely dispersed researchers, students, practising professionals and the general public on local and international levels.

And by cooperating with businesses, professional associations and community organisations to whom they also make the local databases available, libraries can further enrich the content of these online resources and attract financial support for their continued development.

A number of library-based local online databases have already been launched. When I was last at the International Online Information Meeting, I spoke about the Human Genome Data Base (GDB) at the Welch Medical Library of Johns Hopkins University as an example of this new type of online resource (Ref 2). The GDB was designed with input from the library and is managed by librarians working with editorial boards composed of genetics experts. The database contains work from the ongoing studies of thousands of researchers and geneticists around the world (Ref 3). The GDB is not only a valuable resource but it has also set a new standard for research libraries. The GDB and other knowledge bases, as they are sometimes called, embody the methodology of the new librarianship, the *novum organum*, and represent the highest level of information, knowledge and research service to which modern libraries can aspire.

5. The new online

In just the last few years, however, the complexion of online information technology has changed completely, so that the new methods are available even to small libraries. No longer are giant mainframes necessary to host massive databases and search engines for researchers and other users who want the most current information in their fields. Super microcomputers, client/server technology and distributed computing configurations greatly simplify database construction, and make online resource development much more accessible and affordable for libraries. For instance, a high-quality, full-text WWW online database can be constructed for less than $5000, including software that greatly simplifies Web page construction.

The new task facing a library that wants to increase its value as an information resource by producing and managing online databases is finding the 'hidden' information resources for the databases that would be appropriate to the library's mission. For this libraries must look outward to their communities, not to publishers. Academic and research libraries can begin within their own universities or research institutions among the faculty and other associated researchers and experts. After all, researchers, not publishers, are the source of the information libraries customarily add to their collections. And only a small portion of the research findings produced at universities and other academic institutions finds its way into print. The rest remains 'gray literature' that, while of great value to the right persons, never reaches the widest possible audiences.

Public libraries can look to schools, archival collections, local historians, ethnic associations, business and professional organisations, community actions groups, referral centres and other local information repositories to provide the content for valuable online resources. Every community provides unique opportunities to gather information, and the Internet/WWW technology provides an effective and affordable way to distribute it back into a library's community of users.

By exploiting Internet/WWW online technology and developing local databases, libraries can tap new fresh information sources and make them available to local audiences and others dispersed around the world in an online knowledge exchange. Libraries that do this will also induct librarianship into a new and extremely valuable endeavour.

6. The Kapiolani Library

The Library at Kapiolani College of the University of Hawaii has produced several full-text and image databases containing unique bodies of information that are pertinent to the mission of the Library and the College, and valuable to students, faculty and other users worldwide. Unlike earlier knowledge bases, the Kapiolani resources are Web-based, client/server databases. Some of them link the Library's Web servers with our CD-ROM server and online catalogue, and with related electronic resources across the world. Most of the databases were constructed with partner agencies that either were producing new information or research, or else had accumulated collections of knowledge or information that was not reaching the widest possible audiences.

Kapiolani's online databases are managed by the Library staff working together with our research partners in each of the separate projects. The new resources are bringing international recognition to the College, providing course enrichment for the curricula and serving a global audience of faculty, researchers, practitioners, students and the general public.

6.1. Asian studies curricular materials online

One year ago, the Kapiolani Library began a project with the Asian Studies Development Program (ASDP) of the East-West Center in Honolulu to convert a collection of curricular materials into a site for loading onto the Library's Web server. The East-West Center is a research agency of the US government that promotes cooperation and exchanges between America and countries in the Asian-Pacific region. The mission of the ASDP is to promote Asian studies in American higher education. Among its activities, the ASDP sponsors a number of annual Institutes to help faculty from colleges and universities across the US develop Asian studies courses and programmes. Institute participants create course syllabi and other curricular materials, drawing on what they have learned in the Institutes.

The ASDP staff had gathered these syllabi over five years in a growing collection of valuable Asian studies curricular models, and had transferred them to a disk collection, which was available to Institute participants and any other interested persons. The idea to make the collection into an Internet/WWW resource arose in a special workshop for librarians organised by Kapiolani Library staff for the 1995 ASDP Summer Institute in Honolulu, and the ASDP Web site was officially launched a few months later at a hardware and software cost of $4700. The cost was covered by a research grant obtained by the Library to build the resource.

As a Web-based resource, the ASDP full-text syllabus collection reaches audiences well beyond the Institutes, and provides a wealth of models for Asian Studies courses in all fields. In addition, the database attracts submissions from Asianists around the world, which is helping the collection grow even faster. The ASDP staff performs the editorial duties related to the documents in the collection, and Kapiolani librarians maintain the hardware and software.

The ASDP online database, like our other databases, is keyword searchable, accepts online input from users and links to related Internet/WWW resources around the world. We use server software from the National Center for Supercomputing Applications (NCSA), and WAIS (Wide Area Information Servers) and Isite search engines for our databases. Working on these resources has not only upgraded the technical skills of the Library staff but has also helped us become aware of other little-known information collections in our area that could be converted into Web-based resources.

6.2. Emergency medical services data online

Kapiolani's Emergency Medical Services Database (EMSD) was also created within the last year to support the College's internationally recognised EMS Education Department. This Web resource provides direct access to the Library's CD-ROM server and medical CD-ROM indexes for document delivery services, and also hosts a growing collection of EMS research papers. This full-text collection is being developed to benefit EMS practitioners and students throughout Hawaii as well as the Asian-Pacific region.

For this full-text collection we are acquiring EMS information that is relevant to Asia and the Pacific from the US Department of Transportation, which has a vast collection of EMS curricular materials; from the EMS Clearinghouse in Florida, which also has a rich store of pertinent information; and from the US Federal Emergency Management Agency (FEMA), which also deals with EMS matters. We also solicit original submissions of research reports from EMS instructors, professionals and physicians in our hemisphere to create a truly unique database with a distinctly Asian-Pacific orientation.

The EMSD also supports specific EMS courses taught at Kapiolani College. One of them is a new graduate-level course to teach EMS administrators how to implement better emergency medical and disaster preparedness management systems. Partly because of the effectiveness of the EMSD, this course is being revised for distribution via the Internet and CD-ROM throughout Asia and the Pacific. The EMSD will be enriched to support this multi-national educational undertaking. There is a great demand for EMS information and know-how in the Pacific region. Developing nations there know that foreign tourists are more comfortable visiting countries that have excellent hospital and EMS systems in place.

Like the ASDP resource, the EMSD did not cost the Library any money. The Hawaii Department of Health contributed $4400 for the purchase of the necessary equipment, including a high quality scanner. The Library created the Web site, and provides the expertise and staff time to manage it. The EMS Department at Kapiolani College performs the editorial work on the research papers, and provides general guidance about the type of content needed by EMS practitioners, which the librarians then find and add to the site. The EMS staff also maintains the home page's non-library information about the EMS programme, including course schedules, programme descriptions, admissions procedures, faculty lists, etc.

The EMSD project and the others as well have been marked by great enthusiasm in our partner agencies for the technology and what it can provide, and also for the Library for extending the technology to them. Even those who were sceptical of a project at the outset became ardent converts and firm supporters, much like librarians have been with automation in general. As a result, either the projects have come with funding or the partners have been willing to share the costs.

In fact, the EMS faculty were so enthusiastic about the EMSD that in addition to providing the Web-site development funds, they were instrumental in persuading the College administration to create a new librarian position specifically to manage and provide library services to the College's Health Education Departments. That was a battle I had been fighting single-handedly — and quite unsuccessfully — for years, until the EMSD project showed the faculty and the administration what a library could do with the right technology and the right personnel.

6.3. PRAISE

The Pacific Region Aquaculture Information Service for Education, or PRAISE, is a joint, federally-funded project of the Hamilton Research Library at the University of Hawaii's Manoa campus and the Kapiolani Library. PRAISE provides Internet access to a CD-ROM aquaculture index on the Kapiolani Library's CD-ROM server, document delivery of the items located through the CD-ROM index and a 'gray literature' database. The objective of PRAISE is to support the development of the aquaculture industry in the Pacific Region by promoting information transfer.

The Kapiolani Library developed and maintains the CD-ROM server and the PRAISE Web server that integrates these several services into a single Internet resource, and provides world-wide access to the site. The PRAISE document delivery tasks are performed by federally-funded staff at the Hamilton Library. The Kapiolani

Library was asked to participate in the project because of our sophisticated CD-ROM server and because of the Internet/WWW expertise resident on the Kapiolani Library staff. For its part in the project, the Kapiolani Library received $3500 in federal grant funds for a new Web server, with additional funding likely in the future.

7. The Kapiolani Library Databases

The Web servers at Kapiolani Library have been online for a little over a year, and are accessed almost 15 000 times each month on average. Remote sites accessing our online resources include nations on every continent not covered by ice. PRAISE has the highest international access because it is the oldest of the resources with the most well-established user base. Next are the ASDP and EMS databases, which are newer.

The Library is also developing a number of online resources on the history and culture of Hawaii. These include collections of historical documents from the period of the Hawaiian Monarchy, as well as information on Hawaiian folk medicine and medicinal plants, foods of the ethnic groups in Hawaii, local artists and others. In these projects we are cooperating with museums, local ethnic groups, individual writers and researchers, archives and other libraries to develop and maintain the online resources.

These databases are unique in the world, and will provide important information services to our faculty and students while bringing international attention to Kapiolani College and Library. The ASDP database, EMSD and PRAISE were created with no equipment cost to the Library. Instead we received over $12 000 in grants and other funding from our partners in the projects to develop the resources. This, in and of itself, indicates the ripeness of the information sources that are all around us, and the readiness of our users to have online access to this information, even though no conventional publishers would ever touch it. The Kapiolani local database projects also demonstrate the accessibility and affordability of the new online technology that can permanently revise librarianship for the 21st century.

8. The novum organum

This paper has presented some of Kapiolani's local online databases as potential models for the type of resource that libraries of the future can develop. Local online databases like these will greatly help libraries retain their crucial role in collecting and distributing current research in this era of electronic connectivity when the future of libraries is in question.

The most important advances in library science in the next decade and well beyond will involve the development of local online resources, which will soon become as distinguishing a feature of fine libraries as their print collections are now. These databases have greater flexibility of content than print resources and much wider accessibility. Overall, they are even proving to be more economical. Kapiolani's local online resources cost the Library nothing to create. In fact, they were created and developed in the midst of a severe economic downturn in Hawaii that reduced the Library's materials budget by more than 33%. The databases came into being in a year when we had no money to buy new books and were even forced to cancel over 100 subscriptions to periodicals.

Although we had long intended to create local online resources, I think it was partly the Library's inability to obtain new knowledge and information from our customary suppliers — conventional publishers — that motivated us to plunge forward into the new method of information gathering and distribution. The resulting accumulations of new knowledge and the active manner in which they are being accessed by our users have permanently changed the way we at the Kapiolani Library will perform our duties as librarians.

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